



Prevalence of Alcohol in Unintentional Opioid Overdose Deaths, 2017-2020

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Introduction

Although there is substantial literature on opioid overdose deaths (OODs) and polysubstance use, involvement of alcohol in these deaths is less clear. The “fourth wave” of the opioid crisis (2019-present) and the overlapping COVID-19 pandemic likely affected alcohol use among individuals who use opioids. The fourth wave of the opioid crisis is characterized by opioid-stimulant polysubstance use¹; stimulants can mask alcohol's sedative effects,² perhaps resulting in greater alcohol consumption. The COVID-19 pandemic has also amplified risks for increased alcohol use (eg, reduced access to substance use treatment services³ and increased distress⁴). However, it is not evident whether these events have translated into changes in the substances involved in OODs.

We investigated the prevalence of alcohol in OODs from July 1, 2017, to December 31, 2020, in Illinois, including temporal associations between Illinois' COVID-19 stay-at-home order (March 21 to June 5, 2020) and the prevalence of alcohol in OODs. We also assessed differences by sex, race, ethnicity, and age.

Methods

Data on unintentional OODs were culled from the Illinois State Unintentional Drug Overdose Reporting System (SUDORS). After excluding records without results of alcohol toxicology tests (n = 685) or those missing data on decedents' sex, race, ethnicity, or age (n = 1), the analytic sample contained 6774 OOD records. The study was deemed exempt from review by the Northwestern University institutional review board because the data are deidentified and the research is on deceased individuals, which is not considered human participants research and not required to undergo review. This study followed the [STROBE](#) reporting guideline.

Alcohol involvement was assessed using toxicology reports, which describe positive findings of ethanol in peripheral blood, urine, or liver tissue (a less-common but suitable specimen for detection). Deaths were classified as involving alcohol if any level of ethanol was detected.

Statistical analysis was conducted from October 5, 2021, to March 10, 2022. We used a modified Poisson interrupted time series model to assess the role of alcohol in OODs and any changes that occurred during and after the stay-at-home order. Differential trends by sex (male or female), race and ethnicity (analyses by race and ethnicity were limited to those who were non-Hispanic White, non-Hispanic Black, and Hispanic due to the limited number of those of other race and ethnicity [all decedents who were not identified as Hispanic, non-Hispanic Black, or non-Hispanic White; n = 61]), and age (≥ 55 or < 55 years) were investigated using interaction terms. All *P* values were from 2-sided tests, and results were deemed statistically significant at *P* < .05. Analyses were conducted in Stata, version 17 (StataCorp LLC). Further details are available in the eAppendix in [Supplement 1](#).

Results

Of 6774 total OODs (5033 males and 1741 females; 5233 aged < 55 years and 1541 aged ≥ 55 years), alcohol was involved in 2073 OODs (30.6%). Decedent demographic characteristics are presented in

+ Supplemental content

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Table 1. The model failed to identify any significant trend over time prior to the COVID-19 stay-at-home order nor any significant immediate changes in prevalence level or changes in trends after the implementation or withdrawal of the stay-at-home order (**Table 2**). The models that incorporated sex, race, ethnicity, and age revealed differences in alcohol involvement in the years prior to the order. The prevalence of alcohol use in OODs was higher for men than women (prevalence ratio [PR] for women, 0.51; 95% CI, 0.40-0.66), for non-Hispanic Black and Hispanic decedents than White decedents (non-Hispanic Black decedents: PR, 1.71; 95% CI, 1.39-2.09; Hispanic decedents: PR, 1.59; 95% CI, 1.22-2.07), and for decedents aged 55 years or older than decedents younger than 55 years (aged ≥55 years: PR, 1.38; 95% CI, 1.13-1.68). There were no significant changes by subgroup associated with COVID-19 policy changes.

Discussion

Over 30% of unintentional OODs in Illinois from July 2017 to December 2020 involved alcohol. There was no evidence of changes in the prevalence of alcohol in unintentional OODs during or after the COVID-19 stay-at-home order. It is possible our sample size was too small or our period under study too short to detect an association; additional studies are needed, including those that can identify cause if these findings are corroborated. Nonetheless, the fact that 30% of OODs involved alcohol suggests that prevention and mitigation strategies should address alcohol use. Specific attention is warranted given that alcohol may be viewed differently than illicit substances by individuals who use

Table 1. Total Unintentional Opioid Overdose Deaths and Prevalence of Alcohol Involvement in Illinois, July 2017 to December 2020

| Characteristic | Overall deaths | | Deaths before SAH | | Deaths during SAH | | Deaths after SAH | |
|--------------------|----------------|---------------------------|-------------------|---------------------------|-------------------|---------------------------|------------------|---------------------------|
| | Total, No. | Alcohol involved, No. (%) | Total, No. | Alcohol involved, No. (%) | Total, No. | Alcohol involved, No. (%) | Total, No. | Alcohol involved, No. (%) |
| Total | 6774 | 2073 (30.6) | 4865 | 1501 (30.9) | 591 | 155 (26.2) | 1318 | 417 (31.6) |
| Sex | | | | | | | | |
| Female | 1741 | 379 (21.8) | 1275 | 277 (21.7) | 151 | 26 (17.2) | 315 | 76 (24.1) |
| Male | 5033 | 1694 (33.7) | 3590 | 1224 (34.1) | 440 | 129 (29.3) | 1003 | 341 (34.0) |
| Race and ethnicity | | | | | | | | |
| Hispanic | 765 | 298 (39.0) | 517 | 210 (40.6) | 73 | 24 (32.9) | 175 | 64 (36.6) |
| Non-Hispanic | | | | | | | | |
| Black | 2147 | 711 (33.1) | 1462 | 492 (33.7) | 210 | 66 (31.4) | 475 | 153 (32.2) |
| White | 3568 | 960 (26.9) | 2627 | 711 (27.1) | 294 | 60 (20.4) | 647 | 189 (29.2) |
| Other ^a | 294 | 104 (35.4) | 259 | 88 (34.0) | 14 | 5 (35.7) | 21 | 11 (52.4) |
| Age, y | | | | | | | | |
| <55 | 5233 | 1560 (29.8) | 3792 | 1146 (30.2) | 450 | 118 (26.2) | 991 | 296 (29.9) |
| ≥55 | 1541 | 513 (33.3) | 1073 | 355 (33.1) | 141 | 37 (26.2) | 327 | 121 (37.0) |

Abbreviation: SAH, stay-at-home order (from March 21 to June 5, 2020).

^a Includes all decedents who are not identified as Hispanic, non-Hispanic Black, or non-Hispanic White.

Table 2. Alcohol Involvement in Unintentional Opioid Overdose Deaths in Illinois, July 2017 to December 2020 (N = 6774)

| Variable | Prevalence ratio (95% CI) ^a |
|-----------------------|--|
| Time to date of death | 0.999 (0.999-1.000) |
| SAH | |
| Before | 1 [Reference] |
| During | 0.161 (0.000-172.403) |
| After | 0.293 (0.047-1.819) |
| Time × during SAH | 1.002 (0.995-1.008) |
| Time × after SAH | 1.001 (0.999-1.003) |

Abbreviation: SAH, stay-at-home order (from March 21 to June 5, 2020).

^a From a modified Poisson regression with robust SEs and adjusted for seasonality.

opioids and by treating clinicians⁵ and given alcohol's detrimental effect on the liver and the high rates of hepatitis C among individuals who inject drugs.⁶

Limitations of this study include crude measurements of intent (ie, SUDORS may miss the nuances of quasi-suicidal deaths in which decedents feel ambivalent toward life and death) and the extent of alcohol use (ie, we could not determine how much alcohol was consumed).

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Author Contributions: Dr Phillips had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: All authors.

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SUPPLEMENT 1.

eAppendix.

eReferences.

SUPPLEMENT 2.

Data Sharing Statement